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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/766,154	01/28/2004	Kai Xu	BW-DKT03146	3413

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EXAMINER	
JENKINS, DANIEL J	
ART UNIT	**PAPER NUMBER**
1742	

DATE MAILED: 04/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/766,154	XU ET AL.	
	Examiner	Art Unit	
	Daniel J. Jenkins	1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 January 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7,9-13 and 22-24* is/are pending in the application.

4a) Of the above claim(s) *22-24* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7 and 9-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

1. The Examiner has carefully considered Applicant's Response of 1/19/06. As to the traversal of the Restriction Requirement, the Examiner does not find Applicant's traversal persuasive. In particular, the Examiner notes that the method class/subclass currently contains 697 patents. The article class/subclass currently contains 358 patents. A text search of the terms "sprocket or gear" and sinter$3 reveals 7509 related patents. A serious burden is clearly established. The Examiner notes that Applicant has not traversed the assertion that the sprocket or gear could be made by a patentably different method by any showing. The Restriction is maintained. As to the argument present in the Response of 8/29/05 against the then made rejection, the Examiner does not find said argument persuasive. In particular, the end point touching of 2000°F establishes a prima facie case of obviousness, absent a showing that an unexpected result occurs in the higher range (see MPEP 2144.05). Additionally, the addition of the secondary references to cure the deficiencies of the primary reference has been clearly stated for the purposes as stated in the prior rejection, the selective attack of the individual references not providing a persuasive argument.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1-7 and 9-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kosco '747 in view of Baran et al. and Graupner et al. and Kempe et al.
Kosco discloses a method of forming a part comprising:

providing a metal powder comprising:

0.3 to 0.8% carbon (col. 3, line 2);

up to 2% nickel (col. 5, line 52);

up to 2% molybdenum (col. 5, line 50);

up to 0.7% manganese (col. 5, line 51); and

up to about 4% chromium (col. 5, lines 51-52);

compressing the metal powder at 20-70 tsi to form a green compact (col. 7, lines 34-41);

heating the green compact at a temperature of 2000°F to 2400°F for 25-30 minutes for a sufficient time to ensure homogeneous alloying (col. 7, lines 41-58);

forming a densified portion of the heated green compact (col. 8, lines 35-59);

heating the densified compact in the range of 2050°F to 2400°F for at least 20 minutes (col. 8, lines 60-64); and

cooling the compact under rates and times to form tempered martensite (col. 8, line 60 to col. 9, line 16).

Kosco further discloses wherein the forming a densified portion includes hot forming at a temperature of 1800°F for 3 minutes (see Example 2), in the temperature limitation of Applicant's step d) but for less time. The Examiner finding that the time limitation of a small part such as a race would lead to total heating of the part, resulting in the same desired effects as claimed.

Kosco thus differs from the claimed invention by the alloy additions and the full range of various temperature treatments.

Kosco is silent as to other claimed alloy additions including Si, but states that known alloy additions can be added to his metal powder composition (col. 5, lines 31-67).

Baran et al. teaches to add allow additions to steel including less than 1% Si (pp 1-2) in order to improve the corrosion resistance and phase stability.

It would have been obvious to one having ordinary skill in the art at the time of the invention to add Si as taught by Baran et al. to the steel composition of Kosco in order to improve corrosion resistance and phase stability of the steel of Kosco.

Kosco further discloses heating parameters selected for the same purposes as disclosed by Applicant, and would be modified by one of ordinary skill based on the selection of the initial starting alloy in order to achieve the same utility as the disclosed invention.

Kosco '747 further discloses wherein the first cooling step is performed so as to not harden the microstructure, leaving a non-martensitic microstructure of one or more of Pearlite, Ferrite + Pearlite, or Bainite microstructure depending upon where in the cooling range cooling is performed, leaving a hardness of about 6.2 to 7.2 g/cc (col. 7, line 59 to col. 8, line 7.

However, Kosco '747 is silent as to grinding as a working step.

Graupner et al. teaches at col. 5, lines 2-6, that grinding can be performed on formed powder metal gears after a heating step for the purpose of achieving a desired level of accuracy of formation.

It would have been obvious to one having ordinary skill in the art at the time of the invention to incorporate grinding into the working operation of Kosco '747 after sintering

as taught by Graupner et al. in order to improve accuracy of the formed gear. The Examiner finds that the grinding would not be added later in the process, which would defeat the hardening of the formed article.

Additionally, Kempe et al. teaches that known gear geometry includes grooves between rows of teeth, in the same field of endeavor, the finishing of said rows to final tolerance performed by the disclosed process steps.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel J. Jenkins whose telephone number is 571-272-1242. The examiner can normally be reached on M-TH6:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 571-272-1242. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Daniel J. Jenkins
Primary Examiner
Art Unit 1742

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